

What is claimed is:

1. A method for producing machine-verifiable printed material, the method comprising:
extracting print-mark data corresponding to a print mark on a hardcopy of printed material from data corresponding to the hardcopy of printed material;
analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the hardcopy of printed material;
encrypting the quantified printing artifacts;
encoding the encrypted printing artifacts into data corresponding to a machine-readable identifier; and
printing the machine-readable identifier from the data corresponding to the machine-readable identifier on the hardcopy of printed material.
2. The method of claim 1, wherein printing the machine-readable identifier from the data corresponding to the machine-readable identifier on the hardcopy of printed material further comprises printing the machine-readable identifier around a periphery of the print mark.
3. The method of claim 1, wherein encrypting the quantified printing artifacts comprises using a private key.
4. The method of claim 3, wherein the private key is linked to a public key used for decrypting the encrypted quantified printing artifacts.
5. The method of claim 1, wherein encrypting the quantified printing artifacts comprises using RSA encryption or elliptic-key encryption.

6. The method of claim 1, wherein printing the machine-readable identifier comprises printing a barcode.
7. A method for checking authenticity of printed material, the method comprising:
extracting print-mark data corresponding to a print mark of the printed material from data corresponding to the printed material;
analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the printed material;
extracting encrypted printing-artifact data from a machine-readable identifier of the printed material from the data corresponding to the printed material;
decrypting the printing-artifact data from the machine-readable identifier;
comparing the decrypted printing-artifact data to the quantified printing artifacts of the print mark; and
indicating that the printed material is counterfeit when the decrypted printing-artifact data does not match the quantified printing artifacts.
8. The method of claim 7, wherein the decrypted printing-artifact data matches the quantified printing artifacts when the decrypted printing-artifact data and the quantified printing artifacts are within a predetermined percentage of each other.
9. The method of claim 7, wherein indicating that the printed material is counterfeit comprises issuing an audible or a visual alarm.
10. The method of claim 7, wherein indicating that the printed material is counterfeit comprises sending an electrical signal to a point-of-sale device.

11. The method of claim 7, wherein decrypting the printing-artifact data comprises using a public key that is linked to a private key that was used to encrypt the printing-artifact data.
12. The method of claim 11, wherein the public and private key are deactivated after a period of time.
13. An apparatus for producing machine-verifiable printed material, comprising:
 - means for extracting print-mark data corresponding to a print mark on a hardcopy of printed material from data corresponding to the hardcopy of printed material;
 - means for analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the hardcopy of printed material;
 - means for encrypting the quantified printing artifacts;
 - means for encoding the encrypted printing artifacts into data corresponding to a machine-readable identifier; and
 - means for printing the machine-readable identifier from the data corresponding to the machine-readable identifier on the hardcopy of printed material.
14. A scanning system comprising:
 - means for extracting print-mark data corresponding to a print mark of printed material from data corresponding to the printed material;
 - means for analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the printed material;
 - means for extracting encrypted printing-artifact data from a machine-readable identifier of the printed material from the data corresponding to the printed material;

means for decrypting the printing-artifact data from the machine-readable identifier;
means for comparing the decrypted printing-artifact data to the quantified printing artifacts of the print mark; and
means for indicating that the printed material is counterfeit when the decrypted printing-artifact data does not match the quantified printing artifacts.

15. A computer-usable media containing computer-readable instructions for producing machine-verifiable printed material according to a method comprising:
extracting print-mark data corresponding to a print mark on a hardcopy of printed material from data corresponding to the hardcopy of printed material;
analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the hardcopy of printed material;
encrypting the quantified printing artifacts;
encoding the encrypted printing artifacts into data corresponding to a machine-readable identifier;
converting the data corresponding to the machine-verifiable printed material into printer-usable data;
sending the printer-usable data to a printer; and
printing the machine-readable identifier on the hardcopy of printed material.
16. The computer-usable media of claim 15, wherein, in the method, encrypting the quantified printing artifacts comprises using a private key.
17. The computer-usable media of claim 15, wherein, in the method, encrypting the quantified printing artifacts comprises using RSA encryption.

18. The computer-usable media of claim 15, wherein the method further comprises converting the data corresponding to the scanned printed material into gray-scale data before analyzing the data.
19. A computer-usable media containing computer-readable instructions for checking authenticity of printed material according to a method comprising:
 - extracting print-mark data corresponding to a print mark of the printed material from data corresponding to the printed material;
 - analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the printed material;
 - extracting encrypted printing-artifact data from a machine-readable identifier of the printed material from the data corresponding to the printed material;
 - decrypting the printing-artifact data from the machine-readable identifier;
 - comparing the decrypted printing-artifact data to the quantified printing artifacts of the print mark; and
 - indicating that the printed material is counterfeit when the decrypted printing-artifact data does not match the quantified printing artifacts.
20. The computer-usable media of claim 19 wherein, in the method, decrypting the printing-artifact data comprises using a public key that is linked to a private key that was used to encrypt the printing-artifact data.
21. A print system comprising:
 - a first printer adapted to print a hardcopy of printed material having a print mark;
 - a scanner for scanning the hardcopy of printed material and outputting data corresponding to the printed material;

a computer connected to the scanner that is adapted to perform a method in response to receiving the data corresponding to the printed material from the scanner, the method comprising:

extracting print-mark data corresponding to the print mark from the data corresponding to the printed material;

analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the printed material with the first printer;

encrypting the quantified printing artifacts;

encoding the encrypted printing artifacts into data corresponding to a machine-readable identifier; and

converting the data corresponding to the machine-readable identifier into printer-usable data; and

a second printer connected to the computer for receiving the printer-usable data from the computer and printing the machine-readable identifier on the hardcopy of printed material.

22. A scanning system comprising:

a scanner for scanning printed material and outputting data corresponding to the printed material; and

a computer connected to the scanner that is adapted to perform a method in response to receiving the data corresponding to the printed material from the scanner, the method comprising:

extracting print-mark data corresponding to a print mark of the printed material from the data corresponding to the printed material;

analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the printed material;

extracting encrypted printing-artifact data from a machine-readable identifier of the printed material from the data corresponding to the printed material;

decrypting the printing-artifact data from the machine-readable identifier;

comparing the decrypted printing-artifact data to the quantified printing artifacts of the print mark; and

indicating that the printed material is counterfeit when the decrypted printing-artifact data does not match the quantified printing artifacts.

23. The scanning system of claim 22, wherein the scanning system is a portable scanning system or a hand-held scanning system.

24. The scanning system of claim 22, wherein the scanning system is connected to a point-of-sale device.

25. An image processor comprising:

a scanner for scanning a hardcopy of printed material having a print mark and for outputting data corresponding to the printed material;

a computer connected to the scanner that is adapted to perform a method in response to receiving the data corresponding to the printed material from the scanner, the method comprising:

extracting print-mark data corresponding to the print mark from the data corresponding to the printed material;

analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the printed material;

encrypting the quantified printing artifacts;

encoding the encrypted printing artifacts into data corresponding to a machine-readable identifier; and

converting the data corresponding to the machine-readable identifier into printer-usable data; and

a printer connected to the computer for receiving the printer-usable data from the computer and printing the machine-readable identifier on the hardcopy of printed material.

26. A scanning system comprising:

a scanner for scanning a hardcopy of printed material having a print mark and for outputting data corresponding to the printed material; and

a computer connected to the scanner that is adapted to perform a method in response to receiving the data corresponding to the printed material from the scanner, the method comprising:

extracting print-mark data corresponding to the print mark from the data corresponding to the printed material;

analyzing the print-mark data to quantify printing artifacts of the print mark resulting from printing variations occurring during printing of the printed material;

encrypting the quantified printing artifacts;

encoding the encrypted printing artifacts into data corresponding to a machine-readable identifier;

converting the data corresponding to the machine-readable identifier into printer-usable data; and

sending the printer-usable data to a printer for printing the machine-readable identifier on the hardcopy of printed material from the printer-usable data.